UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MEMORANDUM

DATE: July 6, 2010

SUBJECT: Response to Recommendations from the National Remedy Review Board
Omega Chemical Superfund Site, Whittier, California

FROM: Jane Diamond, Director
Superfund Division, Region 9

TO: Amy Legare, Chair
National Remedy Review Board

USEPA Region 9 has reviewed the advisory recommendations of the National Remedy Review Board (NRRB) for the Omega Chemical Superfund Site (Site), as documented in a memorandum dated April 12, 2010. Our response to the recommendations is provided below, and the Region has incorporated these responses into the completion of the Feasibility Study and the Proposed Plan.

The NRRB's recommendations are in ***bold italics*** followed by the Region's response.

1. ***In the package presented to the Board, the preferred alternative includes treatment of contaminated groundwater and supplying the treated groundwater for use as drinking water. Given the presence of multiple contaminants in the groundwater, the Board believes the Region should evaluate whether the cumulative risks associated with site-related contaminants in the treated groundwater fall within EPA's risk range. The treatment standards identified in Table 8 of the package should be modified, as necessary, if it is determined that the cumulative risk associated with exposure to site-related contaminants exceeds the acceptable risk range. The board also notes that not all contaminants of concern, for example hexavalent chromium, were included in the list of contaminants for which treatment standards need to be developed.***

In the information presented to the Board, the treatment standards for each contaminant identified in Table 8 were equivalent to the drinking water standard (if one exists) or to a "to be considered" value (such as the Notification Level established by the California Department of Public Health for water supply systems). Thus the treatment standards represent the maximum concentration allowable in the treated water in order to serve it as drinking water. They do not, however, represent the actual expected concentrations in the treated water based on the treatment technologies identified in the feasibility study. In fact, as in virtually any public water supply system, it is unrealistic to presume that all contaminants might actually be present in the treated water at the regulatory limits (i.e., drinking water standards).

In response to the Board's comment, the Region has evaluated the cumulative risk for the expected actual concentrations in the treated water. The risk calculations were done using the predicted contaminant of concern (COC) concentrations in the influent (i.e., raw) extracted groundwater, the expected removal efficiency achieved by the treatment system (i.e., the treatment system for the Region's preferred alternative), and the resulting calculated COC concentrations in the treated water.

To obtain cancer risk estimates for individual COCs, the calculated concentration in the treated water for each COC was divided by the Regional Screening Level (RSL) value for tap water based on carcinogenic effects and a target cancer risk of 10^{-6} (USEPA, 2009) and the resulting ratio was multiplied by 10^{-6}. The cancer risk estimates for the individual COCs were then summed to provide a cumulative cancer risk estimate.

To obtain the hazard quotient for individual COCs, the calculated concentration in the treated water for each COC was divided by the RSL value based on non-cancer effects and a hazard quotient (HQ) of 1. The HQs for the individual COCs were summed to provide the hazard index (HI).

The cumulative cancer risk estimate for the treated water is 4×10^{-5}, which is within EPA's acceptable risk range of 10^{-4} to 10^{-6}. The non-cancer hazard HI is 0.1, which is less than the non-cancer threshold of 1. The Region also notes that, before being delivered to consumers, the treated water from the Superfund remedy would be blended in the drinking water system with clean water from other sources, thereby lowering the overall cumulative risk.

References:
United States Environmental Protection Agency (USEPA, 2009). Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. Updated December 10, 2009.

2. ***Based on information presented to the Board, the design and operation of the preferred alternative and its costs are impacted by the contamination coming from the sources being addressed by the State. The Board encourages the Region to work with the State to develop a timeline for addressing continuing sources and to consider its options in ensuring that the sources be controlled as soon as possible.***

Beginning in mid 2009, the Region's Omega site team established quarterly meetings with California's Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board (RWQCB) for the Los Angeles area to exchange information about source investigation and cleanup activities within the operable unit 2 (OU2) area and to promote coordination of cleanup actions. We will continue to utilize those meetings to coordinate efforts and address continuing sources of contamination within OU2. We will also work closely with the newly-established DTSC groundwater team for the OU2 area to develop a schedule for ensuring the sources are controlled in a reasonable time frame.

3. ***Based on the information presented to the Board, the two northern area extraction wells identified as part of the preferred alternative appear to be located in close proximity to the McKesson and Angeles Chemical facilities. These two facilities appear to be significant sources that are contributing high concentrations of various chemicals to the OU2 plume. The State indicated that an existing groundwater extraction and treatment system is currently pumping 17-30 gpm at the McKesson facility. The Board recommends that the Region discuss with the State (i.e., Department of Toxic Substances Control and Regional Water Quality Control Board) the possibility of integrating the proposed alternative with the State-lead response (i.e., McKesson or other groundwater extraction system) in the plume area to optimize the overall effectiveness of the preferred containment remedy.***

The Region agrees that any groundwater treatment systems at the Angeles Chemical and McKesson Chemical facilities should be integrated, as appropriate, into the OU2 remedy. A pump-and-treat system currently operates at the McKesson Chemical facility at a rate of about 30 gpm; this rate is too low to achieve capture of the OU2 plume high concentration zone in this area, but it likely captures most of the contaminant mass flux from the McKesson Chemical facility itself. The Region started regular discussions with the State agencies in 2009 to coordinate EPA's remediation efforts with the State's efforts at OU2. To allow timely selection and implementation of the interim remedy, the issue of integrating EPA and State response actions will be addressed during the remedial design (RD) phase. The actual discussion with McKesson Chemical about appropriate integration of the system(s) could start sooner, e.g., during negotiation of a consent decree for the interim OU2 remedy.

4. ***All of the alternatives presented by the Region included extraction at the leading edge of the plume. The Board recommends that the Region, as part of its development and evaluation of remedial alternatives, present additional information that clarifies the protectiveness achieved with the leading-edge pumping as opposed to pumping only at locations immediately downgradient of the two major hot spots. This information should include the cost increment associated with leading-edge pumping and the feasibility of relying on existing wellhead treatment units at production wells near the leading edge of the plume to prevent unacceptable exposure to contaminants in the OU2 plume and limit further spreading of the plume.***

At the outset of the feasibility study, the Region established the following Remedial Action Objectives (RAOs) for the OU2 interim remedy:

> 1) Prevent unacceptable human exposure to groundwater contaminated by chemicals of concern (COCs).
>
> 2) Decrease lateral and vertical spreading of COCs in groundwater at OU-2 to protect current and future uses of groundwater.
>
> 3) Decrease lateral and vertical migration of OU-2 groundwater with high concentrations of COCs into zones with currently lower concentrations of COCs to optimize the treatment of extracted groundwater.

The second RAO listed above was established in recognition of the fact that the groundwater in this area serves as an important source of water supply and that water supply production wells

are located downgradient of the OU2 plume (including three wells within one mile of the leading edge of the plume). Installing extraction wells at only the "hot spot" locations (designated as the central (CE) and northern (NE) locations in the feasibility study) so as to achieve containment of the OU2 plume only as far downgradient as the CE location is not likely to decrease the COC concentrations in the contaminated groundwater that reaches downgradient production wells and thus will not be protective of those wells. Even though the three closest production wells currently have wellhead treatment, those treatment units were not designed to reliably handle the types of chemicals or concentrations of chemicals that are present in the Omega plume. Those wells are also not screened in the right interval to serve as effective remedy wells.

Containment achieved by extraction well systems at only the NE and CE locations would slightly slow the advance of the plume between CE and the leading edge, but it would allow COCs in the plume downgradient of the CE extraction wells to migrate (both laterally and vertically) into uncontaminated portions of the aquifer. As such, containment focused on the "hot spots" would not satisfy the second RAO.

Without the LE extraction wells, the total design extraction rate to achieve and maintain capture across the width and full depth of the plume at the NE and CE locations would still have to be around 2,000 gpm. This would require three additional extraction wells to be installed in both the central and northern pumping locations. The capital costs and the O&M costs for a "limited containment" alternative would thus be roughly the same as under Alternative 6 because the design capacity of the plant and the number of extraction wells would essentially be the same. The elimination of extraction wells at the leading edge would result in reduced pipeline costs and thus a net cost savings of about $1.7 million (slightly greater than 2% of the cost of Alternative 6).

In light of the very limited cost savings, the potential for adverse impacts on downgradient production wells and the fact that the plume would spread into uncontaminated aquifer zones downgradient of the CE location, the Region did not fully develop and evaluate a "limited containment" alternative.

5. ***The Board also believes the Region should explore whether it's feasible to reduce or eliminate pumping from production wells that may otherwise impact the capture zone created by the preferred alternative's extraction wells. For example, the clean water produced by EPA's remedy could be used to offset a reduction in pumping from production wells that are currently capturing some of the OU2 plume.***

The Region agrees that shutting down these production wells would increase the effectiveness of the interim remedy, allowing for complete capture of the Omega plume at slightly lower extraction rates. However, the operation of the production wells is not under EPA's control, and in fact those wells are important elements of the water supply systems in the area. In our initial discussions with water purveyors, the Region has raised the possibility of reducing or eliminating pumping from some of these wells, potentially in exchange for receiving the treated water from the EPA remedy. We will continue to pursue this possibility during implementation of the selected remedy.

6. ***The information presented to the Board did not include an alternative that would include in situ treatment of the high concentration areas of the plume. The Board suggests that the Region consider in-situ treatment (bio or chemical) of the high concentration areas of the plume in combination with the pump and treatment as a means of increasing the cost effectiveness of the preferred alternative.***

The Region evaluated in-situ treatment technologies as part of the feasibility study for the Omega site. The evaluation looked at several options for in-situ treatment, including the injection of compounds to stimulate biological and chemical treatment and the use of permeable reactive barriers. However, as described below, those technologies were screened out in the development of alternatives for an interim remedy.

In-situ chemical treatment could be used in combination with the pump and treat containment scenarios. The in-situ treatment could be applied either throughout the high concentration zones (e.g., by using multiple injection wells) or through the use of interceptors (i.e., reactive barriers) placed downgradient of sources of contamination or near the downgradient limit of high COC concentration zones in groundwater. Although the scale of the in-situ treatment required for such "hot spot" treatment would be smaller than for the full OU2 plume, the same issues of implementability and cost would arise (e.g., depth to groundwater (50-100 feet), difficult access in this highly developed area, potential impact of injected chemicals on end use of treated water, and large area covered by high concentration zones). Furthermore, this treatment may not be compatible with, or may be redundant to, the remedies that the State selects for the source areas under its jurisdiction. Consequently, in-situ chemical treatment was screened out because of these issues. The Region does, however, expect that the State may select source control measures at the source areas that include in-situ treatment. The Region will also re-evaluate in-situ treatment at such time as it considers additional remedial actions for restoration of the aquifer.